Sandia National Laboratories/New Mexico

PROPOSAL FOR NO FURTHER ACTION ENVIRONMENTAL RESTORATION PROJECT SITE 116, BUILDING 9990 SEPTIC SYSTEM OPERABLE UNIT 1295

June 1996

Environmental Restoration Project

United States Department of Energy
Albuquerque Operations Office

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ENVIRONMENTAL RESTORATION PROJECT

SITE 116, BUILDING 9990 SEPTIC SYSTEM
OPERABLE UNIT 1295
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United States Department of Energy

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1. INTRODUCTION

1.1 ER Site 116, Building 9990 Septic system

Sandia National Laboratories/New Mexico (SNL/NM) is proposing a no further action (NFA) decision based on confirmatory sampling for Environmental Restoration (ER) Site 116, Building 9990 Septic System , Operable Unit (OU) 1295. ER Site 116 is listed in the Hazardous and Solid Waste Amendments (HSWA) Module IV (EPA August 1993) of the SNL/NM Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Facility Permit (NM5890110518-1) (EPA August 1992).

1.2 SNL/NM Administrative NFA Process

This proposal for a determination of a NFA decision based on confirmatory sampling was prepared using the criteria presented in Section 4.5.3 of the SNL/NM Program Implementation Plan (PIP) (SNL/NM February 1995) . Specifically, this proposal "must contain information demonstrating that there are no releases of hazardous waste (including hazardous constituents) from solid waste management units (SWMUs) at the facility that may pose a threat to human health or the environment" (as proposed in 40 CFR 264.514[a] [2]) (EPA July 1990). The HSWA Module IV contains the same requirements for an NFA demonstration:

> "Based on the results of the RFI [RCRA Facility Investigation] and other relevant information, the Permittee may submit an application to the Administrative Authority for a Class III permit modification under 40 CFR 270.42(c) to terminate the RFI/CMS [corrective measures study] process for a specific unit. This permit modification application must contain information demonstrating that there are no releases of hazardous waste including hazardous constituents from a particular SWMU at the facility that pose threats to human health and/or the environment, as well as additional information required in 40 CFR 270.42(c) (EPA August 1993)."

If the available archival evidence is not considered convincing, SNL/NM performs confirmatory sampling to increase the weight of the evidence and allow an informed decision on whether to proceed with the administrative-type NFA or to return to the site characterization program for additional data collection (SNL/NM February 1995).

The Environmental Protection Agency (EPA) acknowledged that the extent of sampling required may vary greatly, stating that:

> the agency does not intend this rule [the second codification of HSWA] to require extensive sampling and monitoring at every SWMU. . . . Sampling is generally required only in situations where there is insufficient evidence on which to make an initial release determination. . . . The actual extent of sampling will vary . . . depending on the amount and quality of existing information available (EPA December 1987).

This request for an NFA decision for ER Site 116 is based primarily on analytical results of confirmatory soil samples collected at the site. Concentrations of site-specific constituents of concern (COCs) detected in the soil samples were first compared to background 95th percentile or upper tolerance limit (UTL) concentrations of COCs found in SNL/NM soils (IT March 1996). If no SNL/NM background limit was available for a particular COC, or if the COC concentration exceeded the SNL/NM or other relevant background limit, then the constituent concentration was compared to the proposed 40 CFR Part 264 Subpart S (Subpart S) or other relevant soil action level for the compound (EPA July 1990). If the COC concentration exceeded both the background limit and relevant action level for that compound, or if no background limit or action level has been determined or proposed for the constituent, then a risk assessment was performed. The highest concentration of the particular COC identified at the site was then compared to the derived risk assessment action level to determine if the COC concentration at the site poses a significant health risk.

A site is eligible for an NFA proposal if it meets one or more of the following criteria taken from the Environmental Restoration Document of Understanding (NMED November 1995):

- NFA Criterion 1: The site cannot be located or has been found not to exist, is a duplicate potential release site (PRS) or is located within and therefore, investigated as part of another PRS.

- NFA Criterion 2: The site has never been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/ or constituents or other CERCLA hazardous substances.

- NFA Criterion 3: No release to the environment has occurred, nor is likely to occur in the future.

- NFA Criterion 4: There was a release, but the site was characterized and/or remediated under another authority which adequately addresses corrective action, and documentation, such as a closure letter, is available.

- NFA Criterion 5: The PRS has been characterized or remediated in accordance with current applicable state or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Review and analysis of the ER Site 49 soil sample analytical data indicate that concentrations of COCs at this site are less than (1) SNL/NM or other applicable background limits, or (2) proposed Subpart S or other action levels, or (3) derived risk assessment action levels.

ER Site 116 is being proposed for an NFA decision based on confirmatory sampling data demonstrating that hazardous waste or COCs that may have been released from this SWMU into the environment pose an acceptable level of risk under current and projected future land use (Criterion 5).

1.3 Local Setting

SNL/NM occupies 2,829 acres of land owned by the Department of Energy (DOE), with an additional 14,920 acres of land provided by land-use permits with Kirtland Air Force Base (KAFB), the United States Forest Service (USFS), the State of New Mexico, and the Isleta Indian Reservation. SNL/NM has been involved in nuclear weapons research, component development, assembly, testing, and other research and development activities since 1945 (DOE September 1987).

ER Site 116 is located on the western margin of the Manzanita Mountain foothills within the boundaries of the USFS Withdrawn Area, and is approximately 0.3 miles east of the eastern boundary of Kirtland Air Force Base (KAFB) (Figure 1-1). It is reached via an improved dirt road that branches in an easterly direction from Coyote Springs Road. Coyote Springs Road is a main gravel road that branches from Lovelace Road and runs in an easterly direction up Lurance Canyon. The site lies in a minor southerly-sloping tributary that drains to the alluvial fan surface west of the mountain front. This short tributary drains mountainous terrain immediately north and east of the site with elevations ranging from approximately 6,100 to 7,200 feet above mean sea level (amsl). Outcropping rocks in the immediate area of Site 116 include Precambrian gneiss, metarhyolite, and amphibolite that are unconformably overlain by Pennsylvanian limestone and other sedimentary rocks at higher elevations approximately 0.5 miles east and northeast of the site (SNL/NM March 1996). Recent sediments include a thin discontinuous veneer of stream-deposited alluvial material that is present in the bottom of the tributary in which this site is located, and also colluvial deposits on hillsides near the site. Vegetation in the vicinity of ER Site 116 consists predominantly of sparse juniper and pinon woodlands, low-lying shrubs (including sand sage, winter fat, saltbrush, and rabbitbush), cacti (cholla, pincushion, strawberry, and prickly pear), and grama, muhly, dropseed, and galleta grasses (SNL/NM March 1993).

ER Site 116 includes the immediate area around the five seepage pits and septic tank south of Building 9990 (Figure 1-2). The site encompasses approximately 0.06 acres of southerly-sloping land in the bottom of the minor tributary described above, and lies at an average mean elevation of 6,107 feet amsl. The nearest groundwater monitoring wells (designated the Greystone and School House wells) are located approximately 6,000 feet northwest of ER Site 116 in alluvial fan materials (SNL/NM October 1995), so the exact depth to groundwater beneath Site 116 is unknown. The water level elevations in the Greystone and School House wells in December 1994 were determined to be 5,767 and 5,699 feet amsl respectively (SNL/NM March 1995). A recent potentiometric surface map of the SNL/KAFB area suggests that the water level elevation in the vicinity of the site is about 5,950 to 6,000 feet amsl (SNL/NM March 1996), although groundwater elevation data in the immediate area of the site are lacking. Given an average site elevation of 6,107 feet amsl, the depth to water beneath ER Site 116 would be expected to be from about 107 to 157 feet below ground surface. Groundwater most likely flows into the alluvial sediments away from the mountain front along the top of the shallow subsurface bedrock, which probably slopes to the west or southwest at this location.

The nearest production wells are northwest of the site and include KAFB-2, KAFB-4, and KAFB-7, which are approximately 6.6 to 9.5 miles away (SNL/NM October 1995).

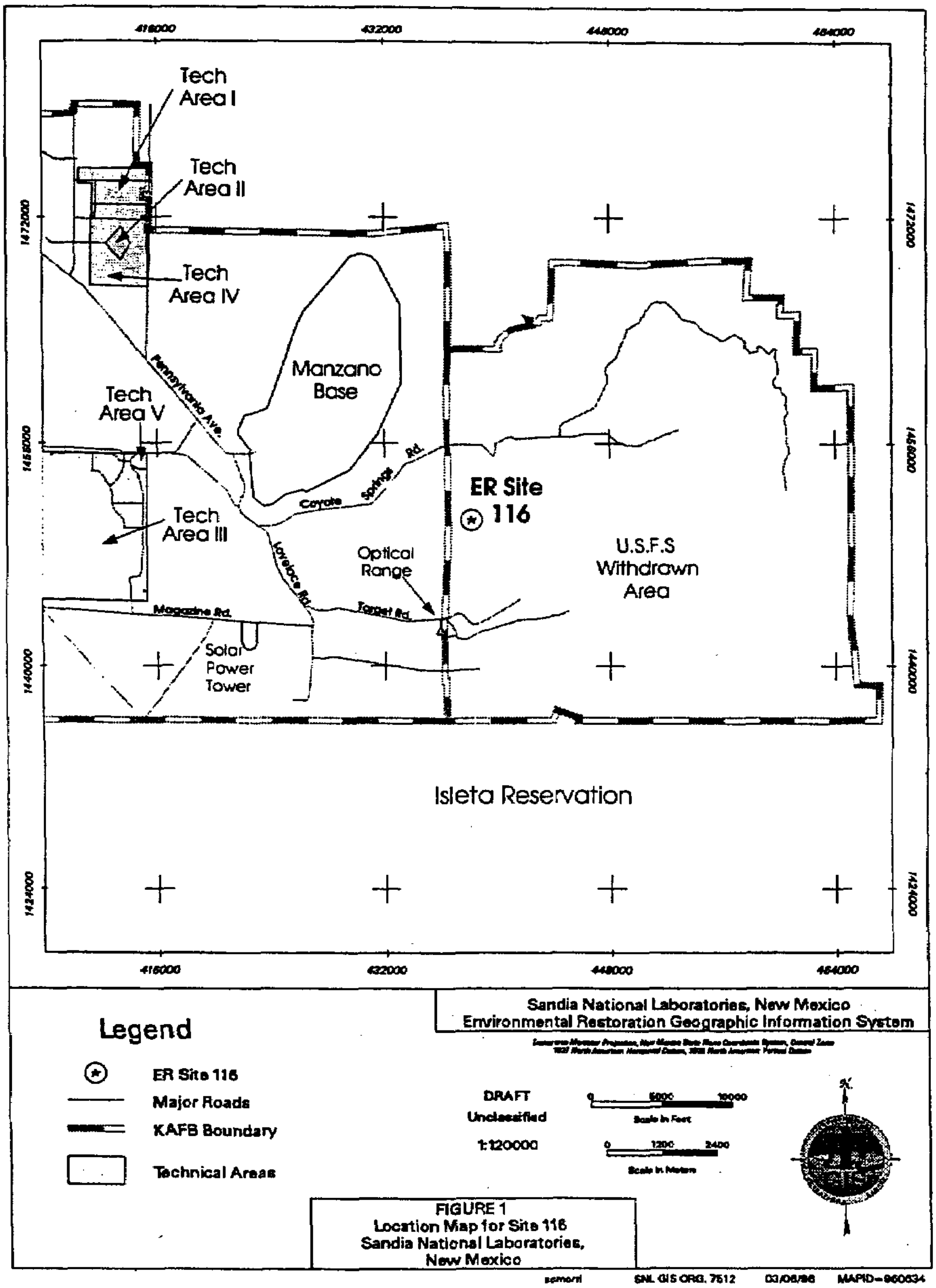

Figure 1-1: ER Site 116 Location Map

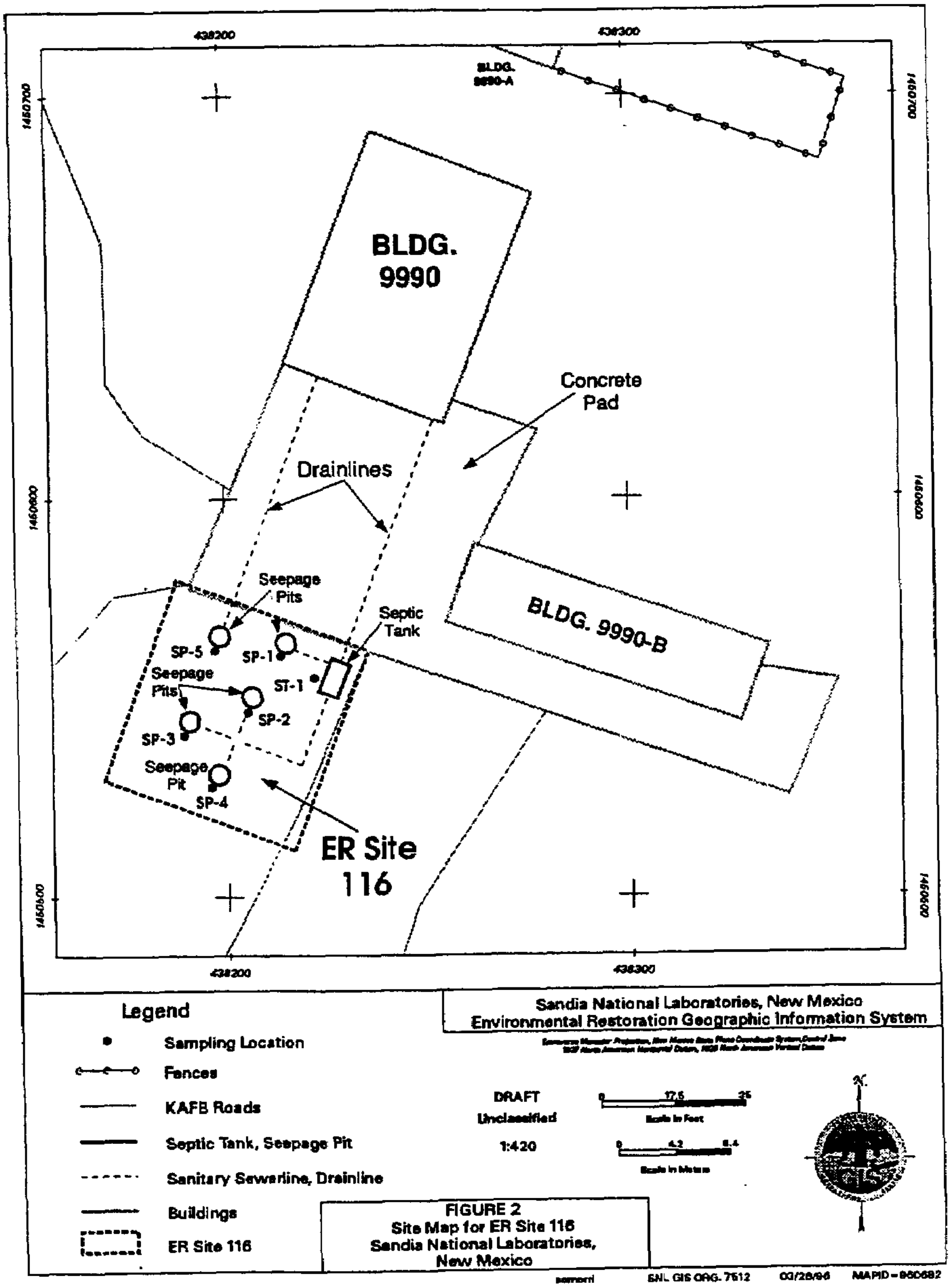

Figure 1-2: ER Site 116 Site Map

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2. HISTORY OF THE SWMU

2.1 Sources of Supporting Information

In preparing the confirmatory sampling NFA proposal for ER Site 116, available background information was reviewed to quantify potential releases and to select analytes for the soil sampling. Background information was collected from SNL/NM Facilities Engineering drawings (SNL/NM January 1968) and interviews with employees familiar with site operational history. The following sources of information, hierarchically listed with respect to assigned validity, were used to evaluate ER Site 116:

- Confirmatory subsurface soil sampling and excavation conducted in January 1995 (SNL/NM January 1995b);
- Two survey reports, including a geophysical survey (Lamb 1994), and a passive soil gas survey (NERI June 1995);
- Results of samples collected from the septic tank in 1992 (SNL/NM June 1993), 1994, and 1995;
- RCRA Facility Investigation (RFI) Work Plan for OU 1295, Septic Tanks and Drainfields (SNL/NM March 1993);
- Photographs and field notes collected at the site by SNL/NM ER staff;
- SNL/NM Facilities Engineering building drawings (SNL/NM January 1968);
- SNL/NM Geographic Information System (GIS) data; and
- The RCRA Facility Assessment (RFA) report (EPA April 1987).

2.2 Previous Audits, Inspections, and Findings

ER Site 116 was first listed as a potential release site in the RFA report to the EPA in 1987 (EPA April 1987). This report contained a generic statement about this and many other SNL/NM septic systems, and indicated that sanitary and industrial wastes may have been discharged to septic tanks and drainfields during past operations (there is no drainfield at ER Site 116). This SWMU was included in the RFA report as Site number 79, along with several other septic and drain systems at SNL/NM. All the sites included in Site 79 are now designated by individual SWMU numbers.

2.3 Historical Operations

The following historical information has been excerpted from several sources, including SNL/NM March 1993, IT March 1994, and SNL/NM November 1994.

Building 9990, the Electroexplosive Research Facility, was constructed in 1969 and was used as an explosive test facility from 1969 to 1986. No explosive testing was conducted after 1986, and no significant activity has occurred at Building 9990 since 1994. Tests were conducted north of the building, and debris from the blasts, which often used depleted uranium (DU), fell out over the area. The septic system for Building 9990 consists of one 750-gallon septic tank connected to a distribution box and four seepage pits, each 5 feet in diameter (Figure 1-2). Three of the four seepage pits are 13 feet deep, and the fourth is 11 feet deep (SNL/NM October 1994). The septic system received septage from restrooms and other drains and was last pumped in the spring of 1989 (SNL/NM March 1993).

A fifth 5-foot diameter by 13-foot deep seepage pit (SP-5 on Figure 1-2) is also located southwest of the building and has received industrial wastewater from the upstairs sink in the darkroom and floor drains on the west side of the building. This pit probably received the largest volume of contaminated wastewater. Photographic chemicals from a darkroom were flushed down the upstairs sink. Spills of PCB-contaminated capacitor oil from a bank of 72 capacitors located next to unprotected floor drains were wiped up, but some PCB-contaminated oil may have washed down the floor drains. In the early 1980s, drums of methylene chloride were stored in the building near the floor drains; leakage may have occurred from the drums and discharged to this seepage pit. Small quantities of dilute copper sulfate from water resistors may have been discharged into either the seepage pit or the septic system.

Estimated effluent discharge rates from the facility range between 60 and 600 gallons/day. The industrial wastewater system and septic system have been inactive since 1989 and a portable toilet was placed at the site at that time. Site 116 is listed as a Radioactive Materials Management Area (RMMA) because of the potential for surficial fragments of depleted uranium (DU) around this site. Assessing and cleaning up DU surface contamination from explosive testing in the vicinity of Building 9990 is not included as part of OU 1295 assessment activities for ER Site 116 Septic System. It was addressed as part of the OU 1332 voluntary corrective measure (VCM) for ER Site 87; this surface cleanup project was completed in December 1995.

3. EVALUATION OF RELEVANT EVIDENCE

3.1 Unit Characteristics

There are no safeguards inherent in the drain systems from Building 9990, or in facility operations that could have prevented past releases to the environment.

3.2 Operating Practices

As discussed in Section 2.3, effluent was released to the Building 9990 septic tank and seepage pits when the septic system was active. Hazardous wastes were not managed or contained at ER Site 116.

3.3 Presence or Absence of Visual Evidence

No visible evidence of soil discoloration, staining, or odors indicating residual contamination was observed when soil samples were collected from backhoe excavations next to the seepage pits and septic tanks in January 1995 (SNL/NM January 1995b).

3.4 Results of Previous Sampling/Surveys

Aqueous and sludge samples were collected from the ER Site 116 septic tank in June 1992 and were analyzed for various organic, inorganic, and radionuclide constituents. Volatile and semivolatile organic compounds (VOCs and SVOCs), metals, phenolic compounds, and other miscellaneous organic compounds were detected in the liquid and/or sludge. Gross alpha, gross beta, and individual radionuclide analyses were also performed on the material. Although some radionuclides were detected, the brief narrative report summarizing the analytical results for those samples stated that "During review of the radiological data, no parameters were detected that exceed U.S. Department of Energy (DOE) derived concentration guideline (DCG) or the investigation levels established during this investigation." (SNL/NM June 1993). The narrative report and analytical results for the 1992 septic tank aqueous and sludge samples are presented in Appendix A.1.

A second round of septic tank sludge samples were collected for waste characterization purposes in May 1994 (SNL/NM May 1994a); the samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP)-list VOCs, SVOCs, and metals, and also hexavalent chromium, cyanide, and polychlorinated biphenyls (PCBs). No free liquid remained in the tank when these samples were collected. No VOC or SVOC compounds, and only barium were detected in the TCLP-derived leachate from the sludge. Cyanide and the PCB compound Aroclor 1260 were identified in the material; hexavalent chromium was not detected. The analytical results of the second round of septic tank samples are presented in Appendix A.2.

A third round of waste characterization sludge samples were collected in January 1995 (SNL/NM January 1995a) and were analyzed for isotopic uranium by an offsite commercial laboratory and for other radionuclides using SNL/NM in-house gamma spectroscopy. Low activity levels of the three isotopic uranium constituents, and a limited number of other radionucludes were detected in the material. The analytical results of the third round of septic tank sludge characterization samples are also presented in Appendix A.2.

A geophysical survey using a Geonics™ EM-38 conductivity meter was performed at the site in February 1994 to attempt to locate moist areas around the seepage pits (Lamb 1994). The results of the survey were inconclusive, and were not used to as a guide in determining soil sampling locations at this site.

A passive soil-gas survey was conducted at the site in two phases. Phase 1 was conducted in May and June 1994 (SNL/NM May 1994b) and included 11 sampling locations. The second phase of sampling at seven additional locations was completed in November 1994 (SNL/NM November 1994b). This survey used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs from the seepage pits and septic tank that may have occurred. A PETREX™ tube soil-gas survey is a semi-quantitative screening procedure that can be used to identify many volatile and semivolatile organic compounds. This technique may be used to guide VOC and SVOC site investigations. The advantages of this sampling methodology are that large areas can be surveyed at relatively low cost, the technique is highly sensitive to organic vapors, and the result produces a measure of soil vapor chemistry over a two- to three-week period rather than at one point in time. Each PETREX™ soil-gas sampler consists of two activated charcoal-coated wires housed in a reusable glass test tube container. At each sampling location, sample tubes are buried in an inverted position so that the mouth of the sampler is about 1 foot below grade. Samplers are left in place for a two- to three-week period, and are then removed from the ground and sent to the manufacturer, Northeast Research Institute (NERI), for analysis using thermal desorption-gas chromatography/mass spectrometry. The analytical laboratory reports all sample results in terms of "ion counts" instead of concentrations, and identifies those samples that contain compounds above the PETREX™ technique detection limits. In NERI's experience, levels below 100,000 ion counts for a single compound (such as perchloroethene [PCE] or trichloroethene[TCE]), and 200,000 ion counts for mixtures (such as BTEX or aliphatic compounds [C4-C11 cycloalkanes]), under normal site conditions, would not represent detectable levels by standard quantitative methods for soils and/or groundwater (NERI June 1995).

A map showing the PETREX™ tube sampling locations, and the analytical results of the ER Site 116 passive soil gas survey are presented in Appendix A.3. BTEX compounds at potentially detectable concentrations were identified in two samplers placed at location numbers 117 and 600 on the PETREX™ sample location map in Appendix A.3; these two locations are on the unpaved access road on the west side of the site. It was assumed that this possible BTEX contamination represented fluid leakage from vehicles driven or parked on the road, and therefore no soil samples were collected near these two sampling locations. BTEX and aliphatic compounds at potentially detectable concentrations were also detected in two soil gas samplers placed at location numbers 113 and 596 on the PETREX™ map; these two locations were located in the northern edge of the seepage pit area, downgradient from a parking area. However, no significant levels of these VOCs or any SVOCs were detected in septic tank and seepage pit soil samples, suggesting that these anomalies are attributable to motor vehicles.

3.5 Assessment of Gaps in Information

The most recent material in the septic tank was not necessarily representative of all discharges to the unit that have occurred since it was put into service in 1969. The analytical results of the various rounds of septic tank sampling were used, along with process knowledge and other available information, to help identify the most likely COCs that might be found in soils surrounding the septic tank and seepage pits, and to help select the types of analyses to be performed on soil samples collected from the site. While the history of past releases at the site is incomplete, analytical data from confirmatory soil samples collected in January 1995 (discussed below) are sufficient to determine whether significant releases of COCs occurred at the site.

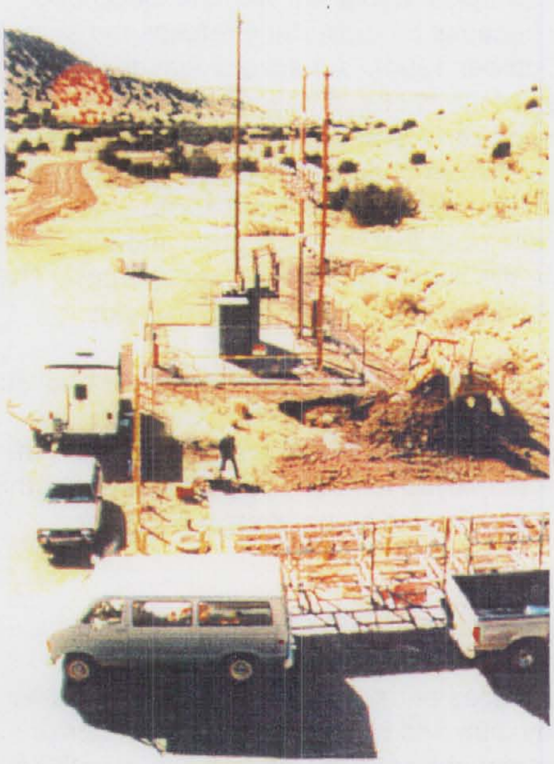
3.6 Confirmatory Sampling

Although the likelihood of hazardous waste releases at ER Site 116 was considered low, confirmatory soil sampling was conducted to determine whether COCs above background or action levels were released at this site. Samples were collected from backhoe excavations next to each of the five seepage pits and from one excavation next to the septic tank in January 1995 (SNL/NM January 1995b). The sampling locations are shown on Figure 1-2, and the sample collection operation around one of the seepage pits (SP-4) is shown in the upper photograph of Figure 3-1. The confirmatory soil sampling program was performed in accordance with the rationale and procedures described in the Septic Tank and Drainfields RCRA Facility Investigation Work Plan (SNL/NM March 1993), and addenda to the Work Plan developed during the OU 1295 project approval process (IT March 1994 and SNL/NM November 1994). A summary of the types of samples, number of sample locations, sample depths and analytical requirements for confirmatory soil samples collected at this site is presented in Table 3-1.

Table 3-1:
ER Site 116: Confirmatory Sampling Summary Table

Sampling Location	Analytical Parameters	Number of Sampling Locations	Depth to Top of Sampling Interval (bgs) at Each Sampling Location	Total Number of Investigative Samples	Total Number of Duplicate Samples	Date(s) Samples Collected
Five seepage pits	VOCs	5	13'	5	1	1/17-19/95
	SVOCs	5	13'	5	1	
	RCRA metals + Cr^{6+}	5	13'	5	1	
	Cyanide	5	13'	5	1	
	PCBs	5	13'	5	1	
	Isotopic uranium	5	13'	5	1	
Septic Tank	VOCs	1	8.5'	1		1/19/95
	SVOCs	1	8.5'	1		
	RCRA metals + Cr^{6+}	1	8.5'	1		
	Cyanide	1	8.5'	1		
	PCBs	1	8.5'	1		
	Isotopic uranium	1	8.5'	1		
SPs and septic tank	Tritium composite	6	8.5' and 13'	1		
SPs and septic tank	Gamma spec. composite	6	8.5' and 13'	1		

Notes
Cr^{6+} = Hexavalent chromium
PCBs = Polychlorinated biphenyls
RCRA = Resource Conservation and Recovery Act
Spec. = Spectroscopy
SPs = Seepage pits
SVOCs = Semivolatile organic compounds
VOCs = Volatile organic compounds



Collecting soil samples from around seepage pits, 1/18/95. View looking west.

Septic tank septage removal and cleaning operations, 12/4/95. View looking northwest.

Figure 3-1 : ER Site 116 Photographs

An attempt was made in October 1994 to collect soil samples at this site with the Geoprobe™ sampling equipment but the effort was unsuccessful because of subsurface refusal and sample volume problems that were encountered (SNL/NM October 1994). A backhoe was therefore used in January 1995 to dig excavations around each of the seepage pits and the septic tank to determine the depth to, and configuration of the bedrock surface at this site. The backhoe was also used to retrieve soil sampling material next to the bottom of each of the six units (SNL/NM January 1995b). It was determined that the depth to the natural bedrock subsurface ranged from 3 to 6.5 feet below ground surface (bgs) at this site, and that an excavation into bedrock to a depth of 13 feet bgs had been dug to accommodate the five 13-foot deep seepage pits. The base of the septic tank was also placed in the same bedrock excavation, at 8.5 feet bgs.

Soil was retrieved from the target sampling depth in each excavation with the backhoe bucket. The material was transferred from the bucket to the appropriate sampling container, and the filled containers were then placed in an ice-filled cooler at the site. Routine SNL/NM chain-of-custody and sample documentation procedures were employed for all samples collected at this site; samples were shipped to the offsite commercial laboratories by an overnight delivery service.

Seepage pit and septic tank soil samples were analyzed for VOCs, SVOCs, RCRA metals, hexavalent chromium, cyanide, and PCBs by an offsite commercial laboratory. Also, to determine if radionuclides were released from past activities at the site, individual samples were collected from each seepage pit and septic tank excavation and were analyzed by an offsite commercial laboratory for isotopic uranium. Single composite seepage pit and septic tank soil samples were also collected and were analyzed by an offsite laboratory for tritium, and were also screened for other radionuclides using SNL/NM in-house gamma spectroscopy.

Quality assurance/quality control (QA/QC) samples collected during this effort consisted of one set of duplicate soil samples from the SP-3 sampling interval (Figure 1-2) and one set of aqueous equipment rinsate samples that were analyzed for most of the same non-radiologic constituents as the soil samples. No significant concentrations of COCs were detected in the equipment blank samples. Except for cyanide, the concentrations of constituents detected in the duplicate soil sample were in generally good agreement with those detected in the equivalent field sample from the same interval. Cyanide was identified at a concentration of 550 ug/kg in the field sample, and 3,700 ug/kg in the duplicate sample from the same interval. Also, a soil trip blank sample was included with the shipment of ER Site 116 VOC soil samples to the offsite laboratory and were analyzed for VOCs only. Trace levels of acetone and methylene chloride were identified in the soil trip blank. These common laboratory contaminants were also found in about the same concentrations in the site samples, and most likely represent laboratory-induced contamination.

Summaries of all constituents detected in these confirmatory samples are presented in Tables 3-2, 3-3, and 3-4. Results of the SNL/NM in-house gamma spectroscopy composite soil sample screening for other radionuclides are presented in Appendix A.4. Complete soil sample analytical data packages are archived in the SNL/NM Environmental Operations Records Center and are readily available for review and verification (SNL/NM January 1995c).
Table 3-2: ER Site 116: Summary of Organic Constituents in Confirmatory Soil Samples Collected Around the Septic Tank and Seepage Pits

Table 3-2

ER Site 116
Summary of Organic and Other Constituents in Confirmatory Soil Samples Collected Around the Seepage Pits and Septic Tank

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	VOCs Method 8240 Acetone	2-Hexa-none	Carbon Disulfide	MIBK	Meth. Chloride	Total Xylenes	SVOCs Method 8270 BEHP	PCBs Method 8080 Aroclor 1260	Cyanide Method 9010/9012	Units
Seepage Pits Soil Samples:															
018921-1,2	Soil	Field	1/17/95	SP1-1	13	5.2 J	ND	ND	ND	2.5 J	ND	ND	ND	ND	ug/kg
018922-1,2	Soil	Field	1/17/95	SP2-1	13	6.4 J	1.6 J	1.1 J	1.1 J	2.8 J	1.6 J	ND	ND	ND	ug/kg
018923-1,2	Soil	Field	1/18/95	SP3-1	13	2.9 J	ND	ND	ND	3 J	ND	ND	ND	550	ug/kg
018924-1,2	Soil	Dupl.	1/18/95	SPD3-1	13	6 J	ND	3.3 J,B	ND	ND	ND	ND	ND	3,700	ug/kg
018925-1,2	Soil	Field	1/18/95	SP4-1	13	ND	ND	ND	ND	2.6 J,B	ND	ND	ND	520	ug/kg
018926-1,2	Soil	Field	1/18/95	SP5-1	13	7.2 J	ND	ND	ND	2.7 J	ND	ND	ND	ND	ug/kg
Septic Tank Soil and QA Samples:															
018927-1,2	Soil	Field	1/19/95	ST-1	8.5	11	ND	ND	ND	2.4 J	ND	ND	39	ND	ug/kg
018928-1,2,5,6	Water	EB	1/19/95	Site 116	NA	ND	ND	ND	ND	ND	ND	21	ND	ND	ug/L
021468-1	Soil	TB	1/19/95	Site 116	NA	8.7 J	ND	ND	ND	5.6	ND	NS	NS	NS	ug/kg
Laboratory Reporting Limit For Soil						10	10	10	10	5	5	330	33	500-1,000	ug/kg
Laboratory Reporting Limit For Water						10	10	10	10	5	5	10	1	10	ug/L
Proposed Subpart S Action Level For Soil						8E+06	None	8E+06	4E+06	9E+04	2E+08	5E+04	9E+01	2E+06	ug/kg

Notes:

B = Compound detected in associated blank sample
BEHP = Bis(2-Ethylhexyl)phthalate
Dupl. = Duplicate soil sample
EB = Equipment rinsate blank
fbgs = feet below ground surface
J = Result is detected below the reporting limit or is an estimated concentration.
Meth. chloride = Methylene chloride
MIBK = methyl isobutyl ketone, or 4-Methyl-2-pentanone

NA = Not applicable
ND = Not detected
NS = No sample
PCBs = Polychlorinated biphenyls
QA = Quality assurance
SVOCs = Semivolatile organic compounds
TB = Trip blank
VOCs = Volatile organic compounds

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Table 3-3

ER Site 116
Summary of RCRA Metals and Hexavalent Chromium in Confirmatory Soil Samples
Collected Around the Seepage Pits and Septic Tank

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	RCRA Metals, Methods 6010 and 7471: As	Ba	Cd	Cr, total	Pb	Hg	Se	Ag	Other Metals: Cr^{6+} Method 7196	Units
Seepage Pits Soil Samples:															
018921-2	Soil	Field	1/17/95	SP1-1	13	3.1	100	ND	3.8	6.2	ND	ND	1.7	ND	mg/kg
018922-2	Soil	Field	1/17/95	SP2-1	13	3.4	107	ND	5.2	5.1	ND	ND	ND	ND	mg/kg
018923-2	Soil	Field	1/18/95	SP3-1	13	3.6	117	ND	4.1	3.6 J	ND	ND	ND	ND	mg/kg
018924-2	Soil	Dupl.	1/18/95	SPD3-1	13	3.7	105	ND	5.4	4.9 J	ND	ND	ND	ND	mg/kg
018925-2	Soil	Field	1/18/95	SP4-1	13	2.9	89.4	ND	3.4	3.1 J	ND	ND	1.1	ND	mg/kg
018926-2	Soil	Field	1/18/95	SP5-1	13	5.1	86.1	ND	3.6	4.7 J	ND	ND	ND	ND	mg/kg
Septic Tank Soil and QA Samples:															
018927-2	Soil	Field	1/19/95	ST-1	8.5	2.5	59.9	ND	2	ND	ND	ND	0.54 J	ND	mg/kg
018928-3,4	Water	EB	1/19/95	Site 116	NA	ND	0.0022 J	ND	ND	ND	ND	ND	ND	NS	mg/L
Laboratory Reporting Limit For Soil						1	1	0.5	1	5	0.1	0.5	1	0.05 - 0.1	mg/kg
Laboratory Reporting Limit For Water						0.01	0.01	0.005	0.01	0.003	0.0002	0.005	0.01	NA	mg/L
Number of SNL/NM Background Soil Sample Analyses *						453	87	502	16	200	218	18	539	393	NA
SNL/NM Soil Background Range *						0.015-9.7	25-180	0.1-7.1	7.5-17	6.5-100	0.05-1.2	1-2.9	0.0015-4	0.02-<2.5	mg/kg
SNL/NM Soil Background UTL or 95th Percentile *						5.6	163	1.6	19	41	<0.8	3.2	2	<2.5	mg/kg
Proposed Subpart S Action Level For Soil						0.50	6,000	80	80,000 **	400 ***	20	400	400	400 **	mg/kg

Notes:
As = Arsenic. Arsenic background concentrations presented above are based on analyses of surface soil samples collected in the Canyons Background, North, Southwest, Coyote Test Field (CTF), and Offsite areas.
Ba = Barium. Barium background concentrations presented above are based on analyses of surface soil samples collected in the Lower Canyons area.
Cd = Cadmium. Cadmium background concentrations presented above are based on analyses of surface soil samples collected in the North, Southwest, CTF, and Offsite areas.
Cr = Chromium. Chromium background concentrations presented above are based on analyses of surface soil samples collected in the Canyons Background area.
Cr^{6+} = Hexavalent chromium. Hexavalent chromium background concentrations presented above are based on analyses of surface and subsurface soil samples collected in the Southwest area.
Pb = Lead. Lead background concentrations presented above are based on analyses of surface samples collected in the Lower Canyons and Upper Canyons areas.
Hg = Mercury. Mercury background concentrations presented above are based on analyses of surface soil samples collected in the Lower Canyons, Upper Canyons, and Canyons Background areas.
Se = Selenium. Selenium background concentrations presented above are based on analyses of surface soil samples collected in the Canyons Background area.
Ag = Silver. Silver background concentrations presented above are based on analyses of surface soil samples collected in the North, Southwest, CTF, and Offsite areas.

Dupl. = Duplicate soil sample
EB = Equipment rinsate blank
fbgs = Feet below ground surface
J = Result is detected below the reporting limit or is an estimated concentration.
NA = Not applicable
ND = Not detected
NS = No sample
UTL = Upper Tolerance Limit
* IT March 1996
** 80,000 mg/kg is for Cr^{3+} only. For Cr^{6+}, proposed Subpart S action level is 400 mg/kg.
*** No proposed Subpart S action level for lead in soil, 400 ppm is EPA proposed action level (EPA July 1994)

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ER Site 116
Summary of Isotopic Uranium and Tritium in Confirmatory Soil Samples Collected Around the Seepage Pits and Septic Tank

Sample Number	Sample Matrix	Sample Type	Sample Date	Sample Location (Figure 2)	Top of Sample Interval (fbgs)	Isotopic Uranium Method HASL-300 (pCi/g) U-233/ U-234 Result	U-233/ U-234 Error *	U-233/ U-234 M.D.A.	U-235 Result	U-235 Error *	U-235 M.D.A.	U-238 Result	U-238 Error *	U-238 M.D.A.	Tritium Method EPA-600 906.0 (pCi/L) Result	Error *	M.D.A.
Seepage Pits Soil Samples:																	
018921-5	Soil	Field	1/17/95	SP1-1	13	1.2	0.2	0.059	0.053	0.037	0.038	1.2	0.21	0.056			
018922-5	Soil	Field	1/17/95	SP2-1	13	0.76	0.14	0.05	0.045	0.031	0.032	0.92	0.16	0.032			
018923-5	Soil	Field	1/18/95	SP3-1	13	0.9	0.16	0.048	0.041	0.03	0.033	0.88	0.16	0.042			
018924-5	Soil	Dupl.	1/18/95	SPD3-1	13	0.96	0.19	0.073	0.037 J	0.044	0.07	0.97	0.19	0.063			
018925-5	Soil	Field	1/18/95	SP4-1	13	0.99	0.18	0.053	0.025 J	0.027	0.036	0.81	0.16	0.059			
018926-5	Soil	Field	1/18/95	SP5-1	13	0.85	0.16	0.049	0.071	0.043	0.046	0.82	0.16	0.059			
Septic Tank Soil Sample:																	
018927-5	Soil	Field	1/19/95	ST-1	8.5	0.65	0.13	0.036	0.045	0.033	0.036	0.76	0.15	0.036			
Seepage Pits and Septic Tank Composite Tritium Sample:																	
018921-3	Soil	Compos.	1/17/95	SP1-5,ST-1/6	8.5 & 13										ND	140	230
Number of SNL/NM Background Soil Sample Analyses **						71			86			157			U		
SNL/NM Soil Background Range **						0.44-<21.4			0.01-0.52			0.153-2.86			U		
SNL/NM Soil Background 95th Percentile **						<21.4			0.18			2.31			U		
Nationwide Tritium Range in Precipation and Drinking Water ***						NA			NA			NA			100-400		

Notes:

U-233 - Uranium 233

U-234 = Uranium 234. Uranium 233/234 background concentrations presented above are based on U-234 analyses of surface soil samples collected from the Lower Canyons and Upper Canyons areas, and surface and subsurface soil samples from the Southwest area.

U-235 = Uranium 235. Uranium 235 background concentrations presented above are based on U-235 analyses of surface and subsurface soil samples collected in the North and Coyote Test Field (CTF) areas. Detection limits for the majority of the U-235 analyses of soil samples collected in the canyons areas were considered too high to allow use of the data for U-235 background calculation purposes, and are therefore not presented herein.

U-238 = Uranium 238. Uranium 238 background concentrations presented above are based on analyses of surface soil samples collected from the Lower Canyons and Upper Canyons areas, and surface and subsurface soil samples from the Southwest area.

Compos. = Composite
Dupl. = Duplicate sample
fbgs = Feet below ground surface
M.D.A. = Minimum detectable activity
ND = Not detected
pCi/g = Picocuries per gram
pCi/L = Picocuries per liter
U = Undefined for SNL/NM soils
* Error = +- 2 sigma uncertainty
** IT March 1996
*** EPA October 1993

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3.7 Rationale for Pursuing a Confirmatory Sampling NFA Decision

As discussed in Section 3.4 above, the passive soil gas survey identified potentially detectable concentrations of aliphatic and/or BTEX compounds at 4 of the 18 PETREX™ soil-gas sampling locations at this site. Two of the four locations were on the unpaved access road on the west side of the site, and probably represent fluid leakage from vehicles driven or parked on the road. The other two locations were on the northern edge of the seepage pit area downgradient from a parking area. No significant levels of these VOCs or any SVOCs were detected in soil samples collected at this site .

Confirmatory soil sampling around the septic tank and seepage pits did not identify any residual COCs indicating past discharges that could pose a threat to human health or the environment. As shown in Table 3-2, only below-reporting-limit concentrations of six VOC compounds (acetone, 2-hexanone, carbon disulfide, methyl isobutyl ketone [MIBK], methylene chloride, and total xylenes), which are common laboratory contaminants, were detected in soil samples collected from this site. Except for 2-hexanone, concentrations of VOCs detected in these samples were also far below the proposed Subpart S action levels for the compounds. No Subpart S action level has been proposed for 2-hexanone.

No SVOC compounds were found in any of the soil samples collected at this site, and only one [Bis(2-Ethylhexyl)phthalate, or BEHP] was identified in the equipment rinsate sample. BEHP is a common component in plastics and is also a common laboratory contaminant.

Cyanide was detected in soils collected around seepage pits 3 and 4 (Figure 1-2), and in the seepage pit 3 duplicate sample in concentrations of 550, 520, and 3,700 micrograms per kilogram (ug/kg) respectively. These concentrations are much lower than the proposed Subpart S action level of 2,000,000 ug/kg for this constituent. Thirty-nine ug/kg of the PCB compound Aroclor 1260 was detected in the soil sample collected next to the septic tank. This concentration is below the current proposed Subpart S action level of 90 ug/kg for PCBs, and is substantially below a new (corrected) EPA-proposed PCB action level of 1,000 ug/kg (EPA December 1994).

As shown in Table 3-3, soil sample analytical results indicate that the nine metals that were targeted in the Site 116 investigation were either (1) not detected, or (2) were detected in concentrations below the background UTL or 95th percentile concentrations presented in the SNL/NM study of naturally-occurring constituents (IT March 1996), or (3) were detected in concentrations well below the respective Subpart S or other action levels for the metals.

As shown in Table 3-4, isotopic uranium activity levels detected in the soil samples collected next to each of the seepage pits and the septic tank were found to be below the corresponding 95th percentile background activity levels for those radionuclides (IT March 1996). Tritium was not detected in the single composite soil sample collected from the seepage pit and septic tank excavations.

Finally, the gamma spectroscopy semi-qualitative screening of the single composite soil sample collected from the seepage pit and septic tank excavations did not indicate significant concentrations of other radionuclides in soils at this site (Appendix A.4).

Finally, the ER Site 116 septic tank contents were removed and the tank was cleaned on December 4, 1995 (SNL/NM December 1995a). The tank was then inspected by a representative of the New Mexico Environment Department (NMED) to verify that the tank contents had been removed and the tank had been closed in accordance with applicable State of New Mexico regulations (SNL/NM December 1995b).

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4. CONCLUSION

Sample analytical results generated from this confirmatory sampling investigation have shown that detectable or significant concentrations of COCs are not present in soils at ER Site 116, and that additional investigations are unwarranted and unnecessary. Based on archival information and chemical and radiological analytical results of soil samples collected next to the seepage pits and septic tank, SNL/NM has demonstrated that hazardous waste or COCs were not released from this SWMU into the environment (Criterion 5 of Section 1.2), and the site does not pose a threat to human health or the environment. Therefore, ER Site 116 is recommended for an NFA determination.

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